This Bulletin is an official publication of the extension service of the Bureau of Sugar Experiment Stations, issued and forwarded by the Bureau to all cane growers in Queensland.

The Cane Growers' Quarterly Bulletin

VOL. XV. 1 JANUARY, 1952 No. 3

Chemical Weed Control

By H. G. KNUST

Weed control by chemicals has been practised in various sugar countries for some years. The first chemicals used generally consisted of an arsenic-soda spray mixture, which killed the weeds but also severely burned the cane leaves until the cane was tall enough to permit of the application of the spray below the canopy of leaves. This method of weed control was also effectively practised in North Queensland in the virgin scrub land from which the stumps and logs had not been removed, but passed into the discard when the land was ultimately cleared and it was possible for implements to be used for weed control. Many operators were severely burned by the caustic action of the arsenic-soda mixture and when the land was placed under normal cultivation no attempt was made to continue the control of weed growth with this caustic spray, continued use of which may have caused an accumulation of arsenic in the soil with consequent ill-effects to the cane crop.

In recent years the increasing difficulty of obtaining adequate farm labour forced growers in other sugar countries, as well as our own, to look for a ready means of chemically controlling weeds, and the use of phenoxyacetic acid and pentachorphenol derivatives soon showed its value in this respect. The widespread success of this method, together with the knowledge that shortage of farm labour and increasing wage bills seriously aggravated the problem of maintaining efficient weed control, prompted intensive investigation into the possibility of chemical weed control in Queensland cane growing areas. Preliminary work was commenced in 1946 but it was not until 1949 and 1950 that field trials were conducted.

The early trials were conducted in seedling flats in the glasshouse on the major soil types of the Bundaberg district, for the purpose of determining the efficacy of the phenoxyacetic acid derivative (2,4-D) for controlling the germination of weeds and grasses. Small exploratory trials were then established in the fields in order to determine economic and efficient rates of application. Striking results were obtained in preventing the development of the shallow germinating

Fig. 54—Rows on right sprayed with 2,4-D at 4 lb. per pacre. Those on left were not sprayed. This picture was taken six weeks after spraying and illustrated the excellent control obtained.

weed and grass seeds with 2,4-D. Fig. 54 illustrates the effective control obtained in a sandy soil, with the equivalent of 4lbs. of 2,4-D per acre, six weeks after the application of the 2,4-D and on which approximately 12 acre inches of water had been applied by natural precipitation and spray irrigation. Control of deep germinating seeds, such as Thorn apple and Noogoora burr, was not entirely successful but the few plants that did germinate and develop were easily controlled with an application of 1lb. of 2,4-D per acre. Fig. 55 illustrates the control obtained on a steep incline in a red volcanic loam, with the equivalent of 4 lbs. of 2,4-D per acre. The photograph was taken 10 weeks after the application of the 2,4-D during which period approximately 8 inches of rain had fallen. In the treated section on the left it will be noted that a few plants of Thorn apple and Noogoora burr persist, but the effectiveness of pre-emergence control is amply demonstrated by comparison with the rank growth of weeds in the untreated section on the right.

The success of these preliminary trials led to the application of 2,4-D to whole blocks of cane to prevent the development of weeds and grass after germination and a tractor boom spray was used for this purpose. Power equipment greatly reduces the cost of application and increases the speed of application as compared with a knapsack spray, but requires intelligent handling as it is relatively easy to miss applying the pre-emergence blanket of 2,4-D to small areas because of an unnoticed nozzle blockage which would result in the germination and growth of weeds and grass.

The possibility of dealing with weeds and grasses as stated above and those which germinated after the pre-emergence effects of the 2,4-D wore off was not lost sight of, and investigations were made to deter-

Fig. 55—Photo taken ten weeks after the rows on left had been sprayed with 2,4-D. Note the vigorous growth of weeds (noogoora burr and thorn apple) on unsprayed rows at left.

mine a suitable contact spray. Contact sprays tried consisted of creosote base or a mineral oil base high in aromatics, together with sodium pentachlorphenate and 2,4-D at varying strengths.

Different concentrations were tried and it was found that a content of 70-85 per cent. creosote or mineral oil with aproximately 3 to 6 per cent. of sodium pentachlorphenol and, in addition, about 3 to 5 per cent. of 2,4-D, gave satisfactory results. Four gallons of the combined mixture readily mixed with 50-60 gallons of water and the mixture killed the young weed and grass growth when applied during the warmer part of the day. This spray should not be applied to the cane leaves as it burns them quite readily.

Contact spray is most effective when applied to *young* weeds and grass, but after the grass shoots have developed more than about six leaves they become more difficult to kill and therefore every endeavour should be made to apply the spray before grass shoots reach the stage mentioned above, otherwise a second application is necessary to obtain a complete kill.

Summarising the results obtained on the more friable soil types: 2,4-D when applied at the rate of 4 lbs. per acre in 20 gallons of water per acre reasonably prevented the development of grass and weed s eds, and did not interfere with the germination of the cane shoot. Creosote or oil base contact sprays effectively controlled young weed and grass growth which developed in areas inadvertently missed when the pre-emergence applications were made and those which developed when the effect of the 2,4-D wore off.

Points to note are:—(1) the land must be free of weed and grass growth before the pre-emergence application of 2,4-D is made, (2) contact sprays should be applied while the weed and grass growth is small and for best results should be applied during the warmer part of the day, preferably between 10 a.m. and 3 p.m.

Farm Made Boom Sprays in Southern Queensland

By H. G. KNUST

When the use of 2,4-D for pre-emergence control of grass and weeds was proved successful beyond the experimental stage, and when the practical application of the material with a tractor driven boom spray had been demonstrated, some growers, with the assistance of the local plumber and blacksmith, made boom sprays for use on their farms. Three such units are described below.

SIX ROW OUTFIT WITH TWO 44 GALLON CONTAINERS

The spray illustrated in Figure 56 consists of two 44 gallon drums coupled in parallel from the bottom of each through a cross connection; the suction hose attaches to the front spare end of the connection and a hose for filling the drums—shown at the back of the drums—attaches to the rear spare end of the connection. The pump, which is mounted on a slotted platform for easy adjustment of the belts, is a 1 inch geared type fitted with a dual 3 inch V pulley and is driven from a 4 inch dual V pulley on the p.t.o. of a Super A.V. tractor. Low pressure valves have been used throughout and the excess liquid is delivered through the by-pass valve in parallel to the top of each drum for agitation purposes. Booms have a total coverage of 27 feet and each is fitted with a cock for independent operation. The boom support consists of a double semi-circular frame of ½ inch pipe suitably spaced to allow for easy travel by the booms when being raised out of the way for turning, etc. The height of the booms when in the spray position can be adjusted by raising or lowering the boom frame on the centre standard. The whole outfit is mounted on a fabricated frame consisting of 3 inch x ½ inch mild steel side members and T iron cross members, and attaches quite easily with three bolts on each side to the final drive housing.

One boom has a T piece fitted to the centre—see left-hand boom—and is used for spraying headlands. The spray material for this purpose is carried in a 4 gallon drum, placed

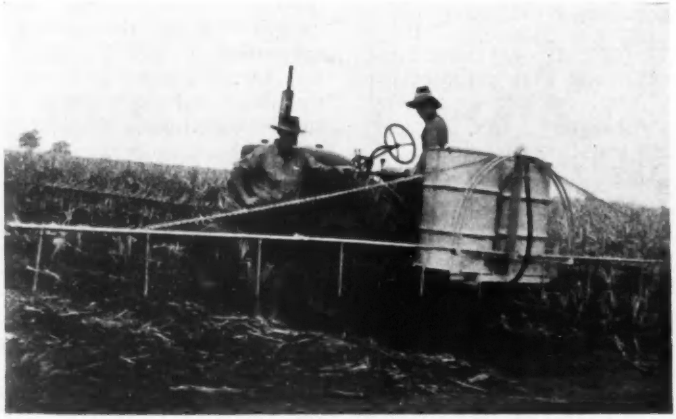

Fig 56—Six row boom spray with two 44 gallon containers.

Fig. 57—Filling spray outfit from a motor lorry.

on a platform beneath the driver's seat, and to the bottom of the drum is attached the suction hose. The by-pass hose is placed in the bung-hole at the top of the drum.

Water for use with this machine is transported to the field in a 250 gallon tank mounted on a stand on the back of a motor lorry so that it is higher than the containers on the spray outfit (Figure 57). When the spray containers need replenishing the small hose on the water tank is inserted in the large hose at the back of the spray containers and the spray containers are filled by gravity while the 2,4-D is being weighed and mixed. The hose at the rear of the spray containers also serves the purpose of measuring the quantity of water in the containers by the simple method of holding a graduated measuring rod against the containers and lowering the end of the hose until the water appears. The reading is then taken by noting the height of the measuring rod at which this occurs.

SIX ROW OUTFIT WITH SINGLE 44 GALLON CONTAINER

The outfit illustrated in Figure 58 consists of a 44 gallon drum mounted horizontally on a 1½ inch angle iron frame which is bolted to the final drive housing of an A.V. tractor. Boom guides consist of double 1 x ¼ inch mild steel straps extending from the top of the centre standard to the

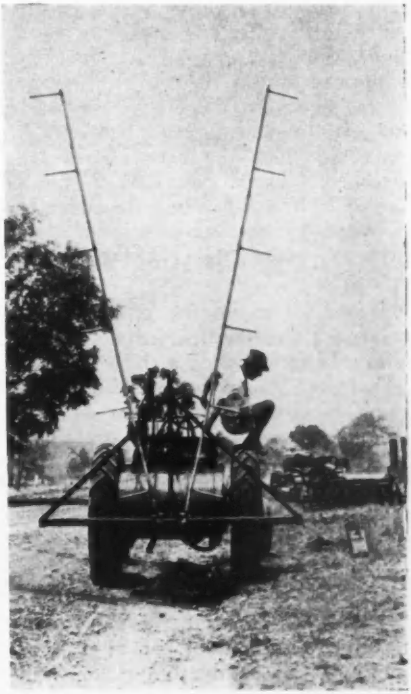

Fig. 58—These booms have a total coverage of 28 feet. Raised for travelling or turning.

end of the boom frames, lifting and lowering of the booms are easily accomplished as the booms travel quite freely between the straps. No provision has been made for raising or lowering the boom frame in order to adjust the height of the nozzles above the surface to be sprayed. This may easily become a decided disability when working in undulating or sloping fields. A 1" gear pump is direct coupled to the p.t.o. of an A.V. tractor through a ½ inch disc of woven insertion to absorb shock and is mounted on a 3 x ½ inch mild steel plate bolted to the driver's footplate. The spray liquid is taken from the right-hand bottom end of the drum through a fine mesh cylindrical screen soldered to a ¾ inch bush to which an elbow, low pressure cock and pipe are fitted for attaching the suction hose. From the delivery side of the pump a short piece of pipe has a T piece fitted and provides for leads to (1) a short standard to which is fitted a high-pressure cock to by-pass the excess liquid to the top of the tank for pressure control, and (2) to the T piece to which the boom hoses are attached. The booms have a coverage of 28 ft. and can be independently operated by opening or closing low pressure cocks fitted at the intake end of each.

Water for use in this equipment is transported to the field in two 80 gallon tanks mounted on a tractor drawn trailer and the spray container replenished by removing the suction hose from the pipe on the container, placing in a vessel on the ground and pumping the water into the spray tank as it is poured into the vessel on the ground.

THREE ROW OUTFIT

Figure 59 illustrates a spray unit mounted on the tool bar of a Ransomes M.G.5 Cultivator. The spray container consists of a 22 gallon wooden cask around which is built an angle iron frame for the purpose of carrying the pump assembly and boom frame. The pump assembly consists of a P.M.S. 1 inch gear pump, filter screen on the intake side of the pump, and a three way cock on the delivery side through which part of the liquid is by-passed to the top of the barrel for agitation and pressure control purposes and the remainder is delivered to the booms. A pressure gauge is fitted to the spray line. The whole assembly is mounted on a metal base and bolted to the angle iron frame. Single A section V belt drive is used from an 8 inch V pulley on the p.t.o. to a 6 inch V pulley on the pump shaft. The height of the boom frame can be readily altered on the centre standard. Boom coverage is 14 feet and each boom can be operated independently by means of cocks provided at the intake end of each. The boom frame is a section of a sulky tyre around which is fitted two large chain links acting as shackles to attach each boom to the tyre, these links slide up and down the tyre and hold the booms in position when they are being raised or lowered. No boom guy ropes or chains are necessary to control lash on these short booms but the centre standard has been extended and has chains attached for holding the booms in position when they are raised to the upright position. The added precaution of attaching the boom frame to the top of the standard with a chain has also been taken.

GENERAL DETAILS

Cost of the machines described above varied from £32 to £55. Pump revolutions varied from 800 to 1400 per minute, pressure varied from 20 to 40 lbs. per square inch, and the quantity of water varied from 20 gallons to 30 gallons per acre. In all cases the machines did a satisfactory job provided the correct pressure was

obtained to suit the type of nozzle in use.

The following suggestions may be helpful to growers contemplating building a machine:— (1) an adjustable boom frame is a "must", (2) high pressure cocks should be used instead of low pressure cocks, (3) hose clips are not altogether satisfactory for connecting hoses to lengths of piping and a hose ring and tail is often preferable, (4) the liquid should be thoroughly screened *before* it reaches the boom line and not through a fine gauze over each nozzle, and (5) suction hose should be used on the suction side of the pump.

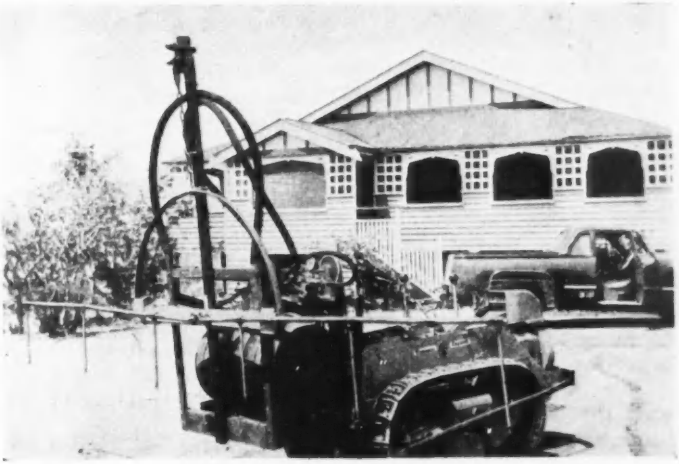

Fig. 59—A three row outfit mounted on a small crawler tractor.

Some Notes an Home-Made Boom Sprays in North Queensland

By G. BATES

There is a definite move by farmers to explore the possibilities of the control of weeds in cane fields by the use of various sprays. Recent experimental work has demonstrated that this method of weed eradication has a place in the economy of cane growing.

For successful spraying on a field basis it is necessary to have a relatively low volume power spray. Such spray outfits are available from a number of firms but these are rather expensive, and until more information and experience is obtained regarding their use, growers are reluctant to outlay the capital required. This has led to the construction of home-made plants and most of these are doing a good job. There are two classes of outfits; (1) the trailer or truck rig, where the pump and boom is mounted on a trailer or truck and driven with a separate power plant, and (2) the tractor rig, in which the outfit is mounted direct onto the tractor and driven from the power take-off. In some cases the pump is driven from

the extra "V" pulley provided on the fan belt of some makes of tractors.

The tractor rig is the most common and althcugh outfits differ in detail they follow the same general pattern.

PUMPS

The pumps are usually ½, ¾ or 1 inch of either gear type or Paul Roller type. This latter type of pump has rotating rubber rollers instead of vanes or gears. These are easily replaced when worn, but it should be realised that the rubbers may be ruined if run without liquid going through the pump. One advantage claimed for this type of pump is that it needs no by-pass valve.

The pumps are usually belt driven with a 5 to 6 inch diameter drive pulley to a 3 or 4 inch pulley on the pump. Pipes and fittings vary from ⅜ inch to ¾ inch galvanised iron according to the ease of procurement of parts. In one case ½ inch plastic hose was used direct from the pump to each nozzle, the iron work merely acting as supports.

In practically all cases the spray container consists of second-hand 44 gallon drums.

In some outfits no by-pass valve is put in the spray line, and with the Paul pump it is claimed that none is necessary when the sprays are shut off. However, such a valve has some advantage, in as much that the return of some of the liquid to the tank would help to keep the spray agitated. Agitation is not greatly necessary for 2, 4-D sprays but is of value when using emulsion sprays such as creosote or diesel oil mixtures.

Strainers are a very necessary part of the equipment as the clogging of jets is a problem. A fairly coarse strainer at the tank outlet with a finer one between the pump and the jets seems desirable. One plant inspected had a packing of steel wool in the pipe line and the operator claimed good results. This steel wool rusts very quickly and would therefore have to be changed often.

The nozzles used may be the Rega Cyclone or the greenhouse type. With a convenient boom length and tractor speed the correct nozzle is used to deliver the amount of liquid required per acre. This may vary from 16 to 40 gallons. Distance apart of the jets depends on the type of spraying required—that is if it is desired to cover 100 per cent. of the land or merely the line of stools. Many growers find it an advantage to give full cover in plant cane, but only to spray the line of stools in the ratoons and cultivate the interspace.

Some of the commercial type boom-sprays are designed to cover seven rows. The ground must be level or uneven spraying will result with such lengthy booms—one side of the boom being too high in the air, while the other hits the soil surface. In such cases three to four rows are probably the maximum that can be treated at a time.

Some details of home built outfits that are working efficiently in North Queensland are as follows—

Mr. A. E. Cottrell's outfit—Aloomba.

This is mounted on a Caterpillar 10, high clearance tractor. Container 44 gallon drum. Pump ½ inch Paul, driven from 6 inch pulley on power take-off with a 3 inch pulley on pump (Fig. 60). The booms are hinged so that they can be lifted, and ½ inch plastic hose connects the pump to jets of the Rega Doublehead type (Figs. 61, 62). The tractor is used in third gear at 3.5 m.p.h.

When spraying only the line of stools, 3 rows are covered by the 3 sets of jets and ten gallons of liquid per acre are used. When complete coverage is required 2 extra sets of jets are fitted and then 15 gallons per acre of liquid are required. Two filters are incorporated in this system.

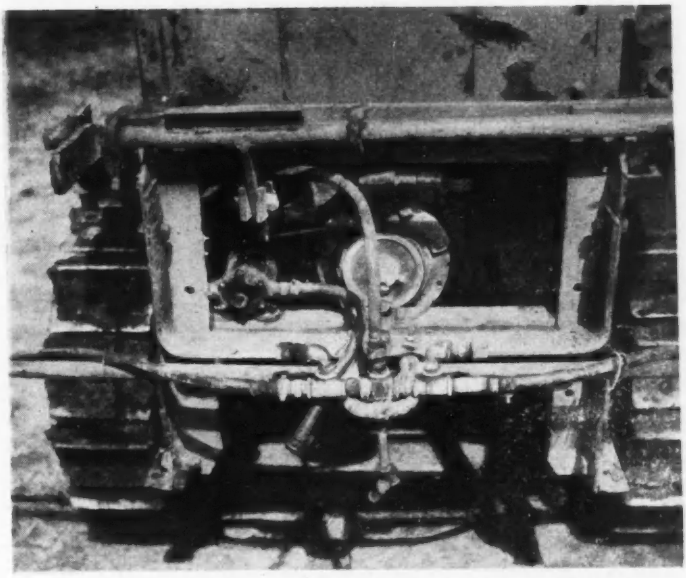

Fig. 60—Showing pump driven from power take off. Note double nozzle for spraying the row between tractor wheels.

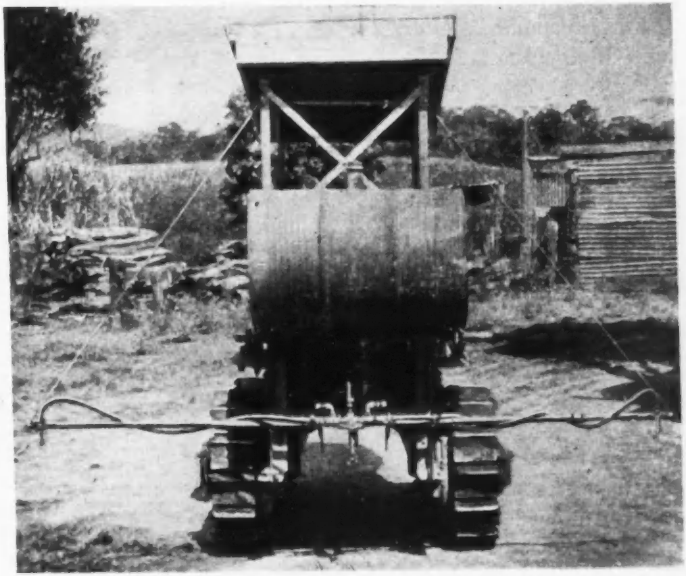

Fig. 61—Showing 44 gallon drum mounted as a container. Note plastic hose connections to nozzles.

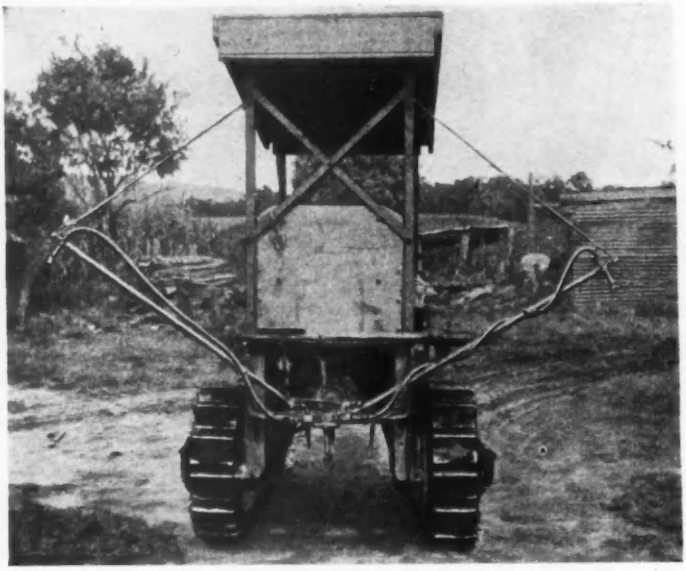

Fig. 62—With boom raised from driver's seat by two cords. Container removed for clear view of pump and boom assembly.

Mr. F. Fapani's outfit—Aloomba.

The outfit is mounted on a Case tractor and driven from a 5 inch pulley on the power take-off to a 3 inch pulley on a ¾ inch gear pump. A release or by-pass valve is provided in this equipment.

A feature is the provision for the attachment of a hose. Sixty feet of hose is attached and this has a trigger release at the hand piece (Fig. 63). This has been found helpful in controlling fires on headlands when burning cane or trash. The nozzle will throw a jet of water 30 feet or it can be used as a fine spray. This spray outfit has various attachments. The one shown in the photograph (Fig. 64) being for spraying along fences where the undergrowth is as high as the fence.

Mr. G. Stager's outfit—Highleigh.

This is mounted on an Allis Chalmers tractor. A ½ inch Paul pump with a 4 inch pulley is driven by a 5 inch pulley from the power take-off (Fig. 65). It is designed for nut grass control, spraying one row at a time with two No. 10 Cyclone nozzles puts out 25 gallons per acre (Fig. 66). The jets work at approximately 24 inches above ground level. The spray container consists of two 12 gallon drums.

In this case also, the spray line to the nozzles is of rubber hose. The pump is mounted on a plate having slotted holes so that the belt may be easily tightened. The operator claims that although a greater quantity of water is required for these jets they do not clog up easily. The whole outfit is attached to the tractor by four bolts.

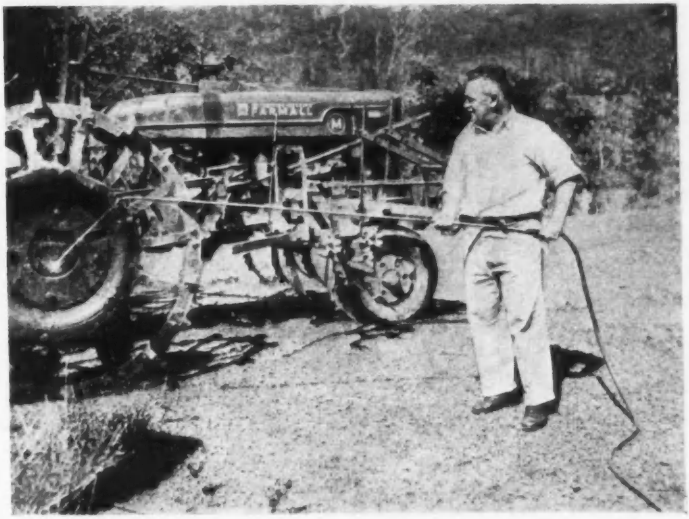

Fig. 63—A hose attachment with a handpiece and spray nozzle. This is a useful accessory for work on headlands.

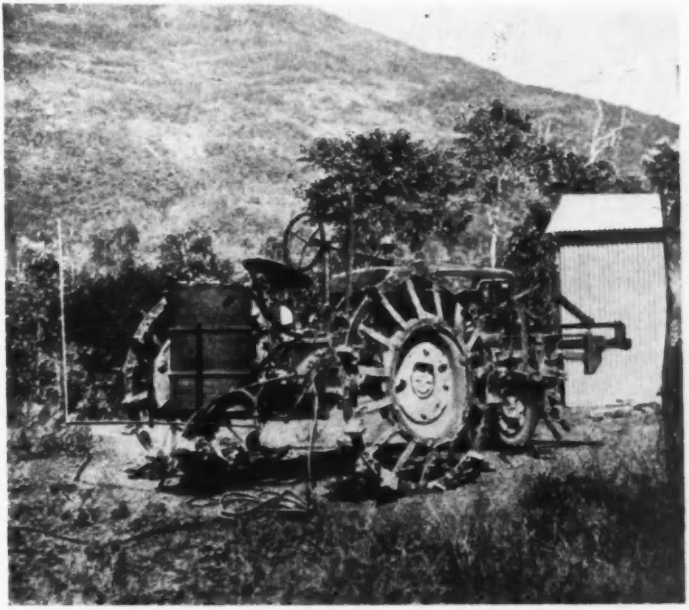

Fig. 64—The upright pipe at left is fitted with nozzles for spraying fence lines or headlands.

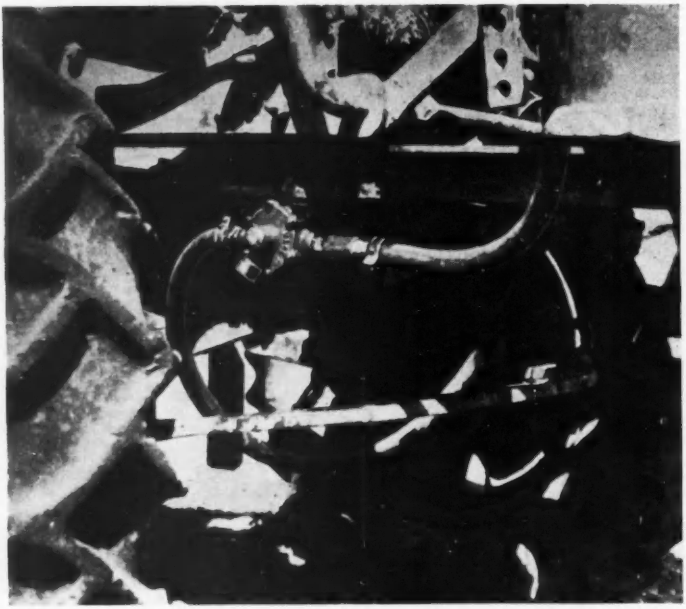

Fig. 65—Paul pump mounted on tractor. Plate carrying pump has slotted holes so that belt may be tightened if required.

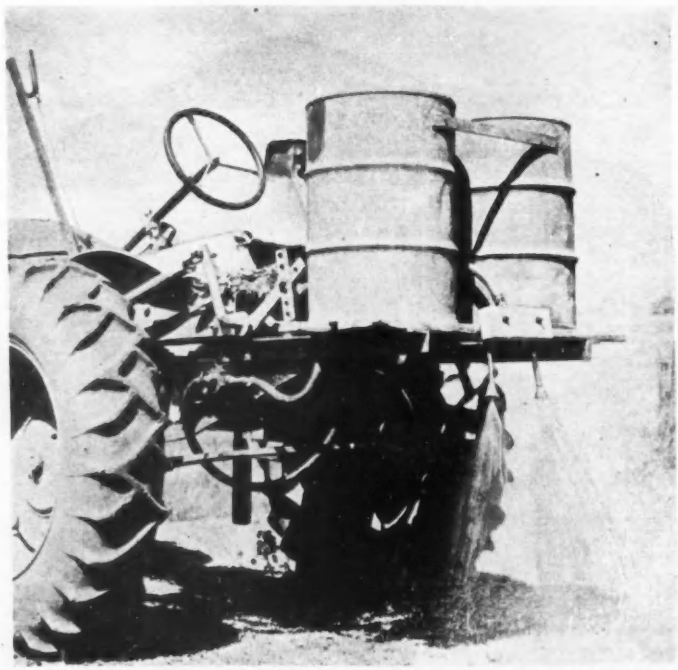

Fig. 66—Outfit used for nut grass control. Two No. 10 Cyclone nozzles spraying the row between tractor wheels.

Maryborough-Bauple District Quarantine Against Chlorotic Streak Disease

By R. W. MUNGOMERY

Reference is made elsewhere in this Bulletin to an outbreak of chlorotic streak disease on a total of 55 farms in the Maryborough and Bauple Mill areas, and attention is drawn to the magnitude of the losses which are possible through the agency of this disease. The presence of a cane disease of this type which can assume such damaging proportions renders it imperative that strict measures must be implemented to check the disease before it becomes more widely established.

A recent Proclamation (No. 21), gazetted under the Sugar Experiment Stations Acts declaring a quarantine in respect of chlorotic streak disease has this objective in view. At the outset, it should be understood that this Proclamation applies only to farms where the disease exists or where it has previously existed up to a year before any proposed planting operations. Therefore, for the information of those growers who are affected by its terms it is proposed to discuss in the following paragraphs to what extent general control measures are applicable in this instance, and also the particular requirements of the Proclamation:—

1. *The use of resistant varieties.*

No varieties on the list approved for planting in the Maryborough-Bauple areas are known to be immune to chlorotic streak disease, but a number, such as Co.290, P.O.J.213, Q.42 and Q.50, offer a fair degree of resistance. Whilst some of these are not particularly suited to the rich alluvial soils where the disease is most prevalent at the present time their use might be extended to some of the poorer soils where the disease has been located. On the other hand some varieties such as M1900 seedling and P.O.J.2878 are known to be extremely susceptible and growers on some of the lower alluvial lands would be well advised to discontinue growing these varieties while the disease is still present.

2. *The use of clean plants.*

Since the disease is spread readily by planting diseased setts, no planting material should be taken from an infected crop. Even crops that show only a light infection must be rejected because, owing to the frequent masking of symptoms, it is quite impossible under these circumstances to differentiate between healthy and diseased stools. Therefore no attempt should be made to select plants from such fields. Instead growers should secure plants from a recommended clean source, and the Supervisor of the local Cane Pest and Disease Control Board will give every assistance in locating suitable sources of clean seed.

In cases where a grower has chlorotic streak disease on his farm or where the disease has been present at any period during the year prior to the time when he proposes to plant, Clause 1 of Proclamation 21 makes it obligatory for him to secure healthy planting material from another clean farm in the area unless permission in writing is granted to use plants from some other safe source on his farm. Such a source might include fields on a higher terrace or on a totally different soil type, and situated some distance away from the diseased field; however, in all such cases prior approval from an Inspector of the Bureau of Sugar Experiment Stations is essential. Since blocks immediately adja-

cent to diseased blocks are likely to be contaminated it is evident that it will be futile to seek permission to draw plant supplies from any such doubtful sources.

3. *Preventive or curative treatments.*

Since the disease is systemic it cannot be prevented by treating the setts with any of the more common fungicides. On the other hand, it has been found that diseased cane can be cured by immersing the sticks or setts in a bath of hot water for 20 minutes at 52°C. or 125°F. Since, however, only about one tenth of the farms have been found to be growing diseased cane, it is considered that ample supplies of healthy planting material can be obtained from the remainder. This would prove a cheaper proposition than subjecting the diseased cane to hot water treatment; nevertheless this latter method should not be lost sight of, in case a particular variety has to be retrieved from a doubtful environment.

4. *Destruction of diseased cane.*

As previously pointed out masking of symptoms is of such frequent occurrence that roguing only obviously diseased stools would be of little avail since a large proportion of the symptomless diseased stools would necessarily be passed over. Nevertheless the danger of allowing the disease to remain as a source of further infection is recognised, and it is in the interest of growers to get rid of their diseased crops as soon as possible.

To prevent the continued ratooning of these diseased fields Clause 2 stipulates that all diseased fields must be ploughed out after the second ratoon crop (or if a standover crop has been grown, then after the third year after the calendar year in which the crop was planted). Clause 3 prevents the acceptance by the mill of any diseased cane which has been grown beyond the stipulated time limit.

The present restrictions are considered to be the minimum requirements if any headway is to be made against the disease. They were designed to impose as little hardship as possible on the growers, and it is felt that if the conditions are strictly observed the disease position should show a gradual but steady improvement.

The Maryborough and Bauple growers have already had the experience of cleaning up one major disease—Fiji disease—within recent years, and there seems no reason why success should not similarly attend their efforts against chlorotic streak disease.

Chlorotic Streak Disease in the Maryborough Area

By N. McD. Smith

Chlorotic streak disease, first distinguished in 1929 as being quite distinct from leaf-scald with which it was previously confused, made a widespread re-appearance in the Maryborough area during the past season. It has been recognised for many years as a disease capable of causing serious economic losses so that a new outbreak such as this calls for prompt control measures.

The first recorded report of the disease in Maryborough was in January, 1947, when a half-acre ratoon field of P.O.J.2878 at The Pocket was found to be infected. Later inspections revealed the disease in other fields of that variety in the same locality but as these blocks were harvested and destroyed, and planting restrictions enforced, the disease appeared to die out. However, four

years later, M.1900 Seedling was found to be heavily infected at Walker's Point and a survey showed the outbreak covered sixteen localities and affected other varieties. Most of the diseased fields over a total of fifty-five farms showed moderate to slight infection but even these blocks may be suffering losses of tonnage and are quite dangerous in spreading the disease. The seriousness of chlorotic streak is not fully realised by many, for the symptoms are not usually so spectacular as those associated with most other major maladies.

The disease spreads most readily and produces its worst effects in cane growing on the alluvial and low-lying soils. This fact is borne out by the centering of the worst infections on these lands at Maryborough.

The disease lacks conspicuous symptoms, and even those available are often difficult to find, and to the untrained eye may be confused with somewhat similar streaks caused by such agencies as leaf miners, or mechanical injury to the leaves during cultivation. The leaf symptoms consist of narrow cream to white longitudinal streaks on the blade of the leaf, ranging in width from 1/16 to 3/16 inch. They follow the general direction of the leaf veins but are rarely of uniform width and have a wavy outline and are often fragmented, thus distinguishing the streaks from those of leaf scald. They may run the whole length of the leaf blade, but are frequently quite short. In older streaks the area within the streak may die and take on an ashy-grey colour, surrounded by a narrow reddish border, but this scalding does not extend outwards beyond the original boundaries of the streak as in the case of leaf scald. The streaks are best found during the late spring and summer months, but even then there may be only one or two streaks per stool. Later in the summer the symptoms gradually disappear in many varieties and by autumn it is frequently impossible to find a single streak in a field known to be virtually 100 per cent. diseased. This applies more to North Queensland conditions than to the south, where symptoms are often seen right through the winter. In the south it is also usual to find that standover crops show a higher percentage of diseased stalks and a greater number of streaks than do year-old crops. Young diseased cane, both plant and ratoon, shows a marked tendency to wilt, even in the presence of excess moisture, and diseased cane has a general unthrifty appearance.

As mentioned previously, the disease is most prevalent on low-lying lands, the heaviest infection occurring in poorly drained parts of the field. The greatest factor in the spread of the disease is the use of planting material from blocks of diseased cane, so it is imperative to use healthy plants. An important factor in the control of the disease is that hot-water treatment for 20 minutes at 52° Centigrade will inactivate the casual agent and healthy growth will result from a treated sett. A portable hot-water treatment plant suitable for attachment to the tow bar of a truck has been used to treat large quantities of cane setts. The bags of setts are hoisted by a derrick and then lowered into the tank for the required time. Although it is sometimes difficult to tow the plant to a convenient position in the field, handy to water, the outfit has been successfully used in the Moreton area.

Carefully planned field trials have shown that the use of diseased planting material may depress yields by up to 40 per cent., and field experience has shown that in badly diseased, low-lying spots of a block the loss may be much greater. The losses are due to germination and ratoon failures, slow coming away, increased

susceptibility to drought and general unthriftiness. The final result in the more susceptible varieties such as Akbar, is a marked decrease in the production of millable sticks. From the recent survey conducted in the Maryborough-Bauple mill areas it appears that all the approved canes are susceptible to a greater or lesser degree. Such being the case, the seriousness of the outbreak cannot be minimised and the present control of planting material on infected farms is fully justified. The supervisor of The Cane Pest and Disease Control Board notifies the farmers concerned of those fields which are apparently free from disease, and which are therefore permitted to be used as plants. Those found to be diseased are marked and a special note states that such fields are not to be used for plants. It must be stressed that this action is in the interests of all farmers in the district and deliberate planting of infected material will incur a ploughout order. Control measures are aimed at the use of clean planting material, and if any grower is at all doubtful concerning the planting material he contemplates using, he should contact the Disease Board officer and follow his advice.

Pineapple Disease in the Mackay District

By C. G. STORY

Climatic conditions in the Mackay district during 1951 were such that many cane plantings were predisposed to attacks by pineapple disease, causing widespread germination failures. This is not a new disease, although it has not been recorded previously in epidemic form in the Mackay district; however, it may have been responsible in the past for more unsatisfactory germinations than have been attributed to it. Fortunately control measures for this disease are cheap and very effective, consisting in dipping the setts in an organic mercurial fungicide which protects the cut ends against fungus attack, and produces a rapid, even germination.

For a full description of pineapple disease, conditions associated with its occurrence, and recommended methods of control, the reader is referred to an article in the Cane Growers' Quarterly Bulletin, October, 1949, by C. G. Hughes and G. A. Christie, and to Farm Bulletin No. 11, by C. G. Hughes. The latter publication may be obtained by any cane grower, from the Sugar Experiment Station in his district, or from the Director, Bureau of Sugar Experiment Stations, Brisbane.

In Mackay the 1951 wet season ceased early in February, and was followed by conditions in March when the monthly rainfall was well below the average. These conditions continued during April when the first reports of poor germinations in early plant cane were received and on investigation these failures were found to be due to pineapple disease. Heavy frosts and cold weather were experienced in May and June, with cold days and five frosts (three of these heavy) in July, when the monthly minimum average was eleven degrees below that of July, 1950. During August there were further cool days and cold nights with four frosts; weather conditions were unsuitable for rapid germinations.

The whole period from April to October was dry throughout most of the area and pineapple disease was responsible for germination failures in a large number of cane blocks on approximately 100 farms in the Mackay-Proserpine area. However,

most of the destroyed plantings were in the more intensively farmed Mackay area. An odd replanting was also necessary because of failures due to red rot, but in these cases the farmers had planted over-mature cane.

Pineapple disease occurred in Q. 50, Q. 28 and P.O.J. 2878 on all classes of land, high and low areas, dry and irrigated farms and on blocks where standover had been destroyed earlier in the year. Other varieties were also affected in localised areas.

The first report of the disease was received after continued germination failures had occurred on an irrigated farm. A five acre block had been planted three times from towards the end of 1950 with very poor results. Thirty tons of plants worth £90 plus the expense of numerous cultivations in land preparation had been written off. In addition the failure of further plantings was almost certain because of seeding of spores of the pineapple disease fungus in the soil from previously destroyed and disintegrated pineapple-diseased setts. The grower was advised to dip his plants in "Aretan" at the rate of 1 lb. to 20 gallons of water before replanting the fourth time. An excellent germination resulted in the field within a month. So complete was his confidence in this method of treatment that the grower dipped the remainder of his planting material, and intends to do so in the future. From the commencement of germination this block was an example to growers in the area, and by November, 1951, this irrigated block with its excellent stand of green, rapidly growing cane was an admirable sight.

The disease was publicised in the local newspaper and at the Mackay Agricultural Show, and other growers who dipped their plants obtained excellent germinations. Most of the areas which failed to germinate were not reploughed; the drop planter was run over the old drill and the dipped, protected setts were planted alongside or on top of the rotting pineapple diseased setts. In some cases the replanting was made in the interspaces. Dipped plantings were made throughout the winter with very good results. That it does not pay, even in warmer weather, to take chances where pineapple disease is known to be on the farm, was emphasised for one grower who had pineapple disease germination failures. He then dipped and obtained an excellent germination and stand, but later a two acre block, where standover cane had been destroyed was planted without dipping. The germination in this field was a failure due to the disease, and it was replanted in September with dipped plants, a complete germination resulting.

While checking diseased setts in rows of plant cane, it was found on odd occasions that setts from a whole stalk were affected, while setts from the next stalk were not affected. This suggests that in such cases the disease may have been in the stalk before planting.

Various outfits for dipping were used in the Mackay district but no large capacity dipping plants were built. Neither time nor materials allowed this, but some growers intend being prepared for next year. It does not require a costly plant for dipping since one grower dipped and planted cane for over 100 acres, using two 44 gallon drums (one at each end of the field), some light, four gallon oil drums as plant containers and two plough chains as support for the oil drums. Fresh solution (2 lb. to 40 gallons of water) was used for every four tons of plants treated. Another grower, with 17.3 acres to replant used 40 tons of plants which were cut into setts by a circular saw. The use of a cradle to hold the bundles of cane for cutting into setts by the saw made this work quicker and

Fig. 67—A dipping plant with a 500 gallon tank.

easier. One cwt. of setts were placed in half forty four gallon drums, and dipped in a trough containing the solution. Fourteen pounds of Aretan were used to treat these 40 tons of plants and a good germination resulted from replanting in June following the earlier failure due to pineapple disease. The use of a circular saw definitely accelerated the rate of plant cutting.

The dipping plant shown in Figure 67 comprises a 5 ft. diameter, 500 gallon tank containing 300 gallons of solution. The lifting tackle, constructed of bush timber, consists of a swinging jib turning on a wooden base. It is supported by three twenty-five foot stays. Two packing cases were used as dipping boxes, each holding sufficient plants for 14 chains of row. These boxes were self tipping, the steel handles being connected below the centre of gravity, with two Tee hinges holding the handle in place until the load was ready for discharging. Lifting one hinge allowed the box to turn over and dump the plants. The capacity of the planter box was sufficient plants for 30 chains of row. With this outfit, four men planted three acres per day; one man on the tractor, one on the planter and the other two cutting stalks in the field, carting, cutting plants, dipping and draining. This was one man above the ordinary team used for planting with a cutter planter. A circular roadway around the dipping outfit saved time on loading. The plants were kept clean on a layer of trash before dipping and it was found on measuring that forty gallons of solution were required to dip twelve tons of Q. 50 plants. Assuming that an eight hour day was worked, the costs are compared with those for the cutter planter, it is estimated the value of Aretan and extra labour was £25 for the 20 acres. No cost of the outfit was considered as it will be available for use for many years.

To obtain full value from the dipping solution it is necessary to keep plants clean, since the introduction of a large amount of dirt into the dipping tank may cause precipitation of the mercury with consequent deterioration of the solution. Blackness of the solution, of the tank at the level of the liquid and of the sludge on the bottom is a sign that the liquid no longer contains sufficient mercury in solution to be an effective fungicide. However, with care, the solution will last the farm planting. Tanks should be protected with a bituminous paint such as is sold by the oil companies for use on farm implements.

Two spraying outfits for attachment to cutter planters, have been developed by A. H. Nuttall and A. B. Milne respectively. Three Milne cutter planters with spraying outfits attached were used in the area and a wetter and spreader was used with the spraying solution. A dipping versus spraying trial has been set out

on a block where pineapple disease was responsible for a germination failure, but complete results are not yet available.

When dipping of plants was first advised, growers immediately thought of the retrograde steps involved in the job of cutting plants and using a drop planter; after reverting to this method it was not found to be so laborious as at first considered. The excellent germinations which resulted following the original failures of many undipped plants have gained many adherents to the practice of dipping, and numerous growers intend dipping before planting in 1952. Others are in favour of dipping merely to obtain the advantage of the stimulatory effect of mercurials on the setts. This has a strong appeal, especially when all eyes germinate and the cane comes up uniformly with a very high concentration of shoots per chain of row. In a number of cases all shoots on four-eye setts have germinated, some within five days after dipping and planting. It will be evident that under such conditions it is possible to reduce the amount of cane planted per acre.

One of the most expensive operations on the farm is planting cane, and failures are costly. However, failures need no longer occur since it was proved conclusively in the Mackay District in 1951 that dipping cane plants in a mercurial solution before planting would control pineapple disease, stimulate the germination of cane setts, produce an excellent germination and allow the establishment of a good stand of cane under adverse planting conditions. But dipping will not ensure a good strike from poor plants nor will it make eyes germinate when soil conditions are too cold. Providing the plants are sound and soil conditions fair a germination is practically assured.

The Circular Saw for Cutting Plants

By E. V. HUMPHRY

The treatment of cane setts with mercurial solutions has become almost a standard practice for the control of pineapple disease on the farms of the Lower Burdekin. It has been established that treated setts are able to withstand the attacks of the pineapple disease fungus (*Ceratostomella paradoxa*) for considerable periods, so allowing the sett plenty of time to germinate. In addition, even in the absence of this sett-destroying organism treated setts germinate more quickly than those untreated.

In this area there are two ways of treating cane setts: by dipping (described in Farm Bulletin No. 11 by C. G. Hughes), or by using the Nuttall spray attachment on the cutter planter where the setts are sprayed as they slide down the chute. Dipping, of course, necessitates a return to the drop planter and the hand cutting of plants which some farmers consider means more work, and in these times of labour shortages, more time taken over planting. In the 1950 planting season, two growers, Messrs. E. Seymour and Chcoropodski, used a circular saw as a means of speeding up the cutting of setts, and in the 1951 planting many growers in the four local mill areas used circular saws with marked success and claimed to plant as much in a day as when formerly using the cutter planter.

The ingenuity of Queensland cane growers is well illustrated by the equipment which the local Burdekin farmers have developed in combining

Fig. 68—Dipping plant with motor-driven winch and saw.

the circular saw with the pre-planting dipping of setts.

In the plant shown in Figures 68, 69, and 70 an engine is mounted on the same chassis as the tank and is used both for driving a circular saw mounted at the rear of the tank and for lifting the box of cut setts. A dog clutch enables the winch to be thrown in or out of gear and a brake on the winch drive holds the box above the tank for draining. The saw is mounted in such a position that when the box is lowered to the ground (or better still on to planks to prevent it picking up dirt) the setts can be cut on to a galvanised iron chute and so slide directly into the box.

In another type of plant the saw is mounted on a frame attached to the front of a tractor (see Figs. 71 and 72) and driven by belt from the power pulley. The box may then of course be lowered on either side of the tank and the tractor shifted to suit. How-

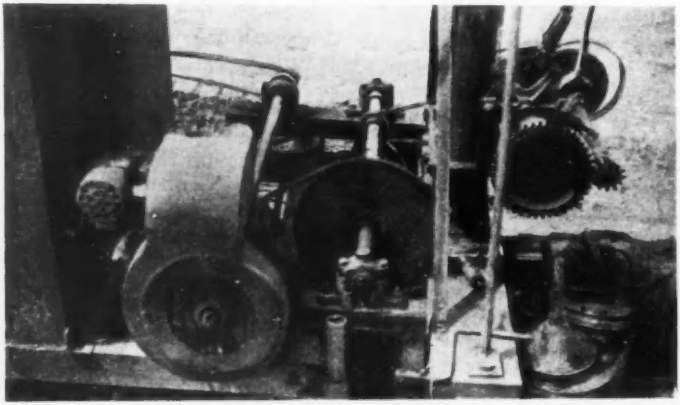

Fig. 69—The source of power for the dipping plant shown in Fig. 68.

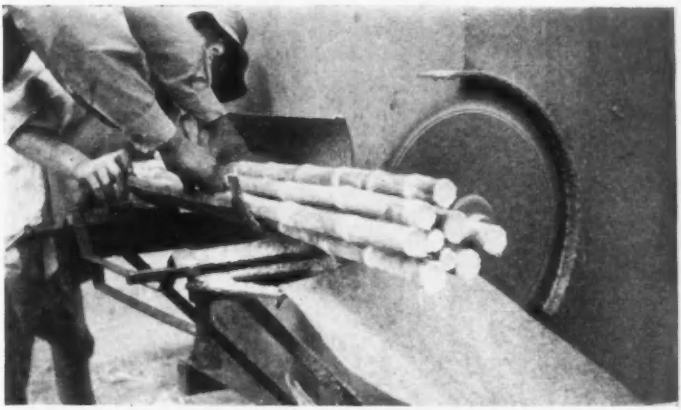

Fig. 70—A circular saw in action. Note the bench runners, the chute to the box and the clean cut ends of the stalks.

ever, not many growers have a spare tractor on which to mount the saw. It will be noted that one grower at least has found the tractor-mounted saw can be profitably used even with hand dipping baskets (Fig. 72).

A third type of plant has been developed by a Home Hill grower (Figs. 73 and 74). It consists of an engine, circular saw, dipping tank and a conveyor belt all mounted on an old truck chassis. The setts fall directly into the solution and are then picked up by the conveyor and so into the waiting motor lorry. In operating this equipment in the field, the standing cane is first stripped and cut down and the apparatus towed alongside by the lorry as seen in Fig. 74. The cane is cut into setts and when the lorry is fully loaded it is driven to the field where planting is in progress. The setts have to be transferred to the planter by hand but there is no obvious reason why this bottleneck should not be easily broken.

Fig. 71—A tractor mounted saw.

Fig. 72—Using a tractor-mounted saw in combination with hand dipping baskets.

The most popular size for the saw is 20" diameter with the teeth filed to sharp points and with little or no set. Some saws 30" in diameter have been used and some growers are even using their firewood saws, but it would appear that the smaller saws are the more suitable. The job done varies with individual saws and some varieties cut more cleanly than others, but slightly ragged end is left even with the best saws and with some of the big saws the cut ends of the setts, as remarked by one grower, look like shaving brushes. The cut ends shown in Fig. 70 are as good as can be expected.

The saw bench is much the same in all units. It consists of a trough of heavy galvanised iron mounted on runners of angle iron. These move on steel balls held in angle iron welded to the framework with the V uppermost. The trough is higher at the back than the front so that the bundle will remain intact as the saw cuts through the sticks. A return spring to draw the bench back after each cut is advisable as it enables the operator to have both hands free to handle the bundle of cane, and it also holds the bench while the bundle is being adjusted in the trough. The engines used to power the saws are small and quite economical to run. Usually they are petrol driven and are rated at three or four horsepower. Suitable gearing has, of course, to be installed for the operation of the winch.

The length of plants is governed by the operator as he moves the bundle forward for each cut and after a little practice it is possible to cut plants of a very even length. It is considered that the careful operator will destroy fewer eyes than the average hand cutter. The size of the bundles ranges from six or seven stalks up to 16 or 17 depending on the strength and skill of the operator and thickness of the cane. An average of about nine stalks is considered "good going" with most Burdekin varieties.

With stripped cane it is possible for two men to cut one cwt. of plants per minute without undue effort, so an average planter box can be filled in eight minutes compared with about 40 minutes for two men with knives. Usually two men can keep the planter going and in addition strip some of the cane, but on one farm a

skilled worker managed to keep up the supply of plants on his own.

No accidents have been reported since the saws have come into vogue but even so it is advisable to have a guard over the saw on the non-cutting side. Sufficient cane cut by saws was planted during 1951 to lead to the conclusion that this method of cutting gives as good results as any other and that it certainly saves time and labour in getting the setts ready for the planter.

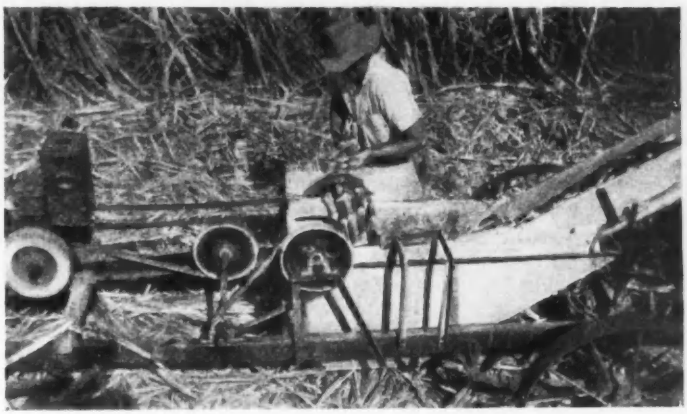

Fig. 73—A saw and chassis-mounted tank being used in the field.

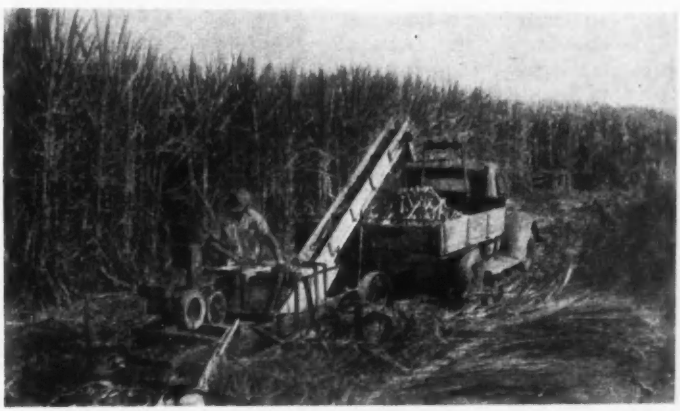

Fig. 74—The dipped setts are picked up by the conveyor belt and dropped into the back of a motor truck.

A Simple Machine for Pushing Cane Breaks

By S. O. SKINNER

During the Conference of the International Society of Sugar Cane Technologists which was held in Queensland last year, many overseas delegates paid high tribute to the ingenuity of the Queensland cane-grower in constructing farm machines to meet practically any task on hand. One machine which interested them was the simple adaptation by Mr. T. Elston, Lower Tully, of a rotary hoe for the rapid pushing of fire breaks in cane fields.

The accompanying photographs show the rotary hoe with attached bars, and a fire break being pushed by it. The machine virtually burrows through the cane, finding its own course along the interspace. While the cane is lifted and parted to each side, the hoe blades, chopping into the soil, destroy all fallen leaves and weeds, to leave a clean and well defined path. A 20 chain break, much superior to that possible by hand, can be pushed in as little as five to seven minutes.

The weight of cane that can be lifted and pushed is amazing. The only fields that have caused difficulties have been fallen, grub-damaged crops with the stools out of the ground; in such cases the stools tend to build up in front of the machine. Normal crops can be pushed with extreme ease while 40 to 45 tons per acre stands of sprawled Trojan and Badila have called for only occasional stops.

The pushing attachment is fitted to a DH22 Howard Rotary Hoe with a 3 feet cut. It consists of two parts, namely:—

(1) A front arm for lifting and parting the cane, and which also determines direction for automatic steering by the machine.

(2) Two side pushing bars.

The front arm is made from a length of $\frac{3}{4}$ inch galvanised piping bent in a "V" shape, in front of which is a broad roller. This arm extends some six feet forward of the machine, but a greater reach would be preferable. The two ends of the piping fit into recesses on the ends of the steering tie-rod in front of the two front wheels. The roller, about eight inches wide by six inches in diameter, fits with the "V" or apex of the arm and supports the end of it. A wide roller is of importance as a narrow wheel tends to press into the ground when any weight from fallen cane causes pressure. In this case the grower has used for the roller a petrol tank from an old Fordson tractor. The arm has an inclination from near ground level at the

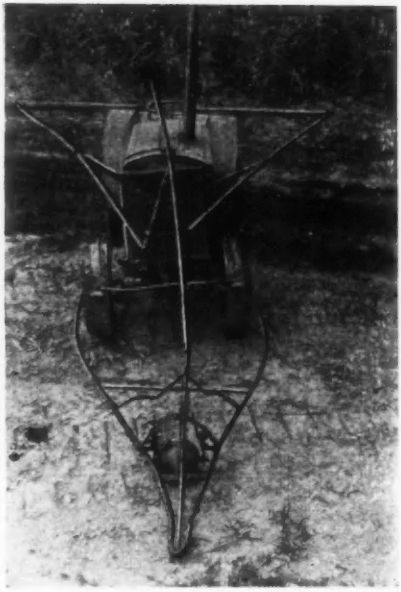

Fig. 75—Illustrating the attachment for making fire-breaks.

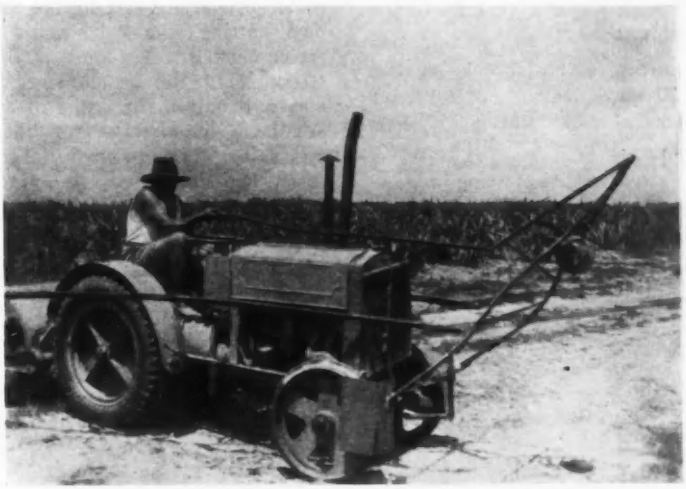

Fig. 76—Note how the attachment may be raised for turning on headlands.

roller to some eighteen inches where it is attached to the steering tie-rod of the rotary hoe.

A loose bar, again of ¾ inch piping, extends from the front of the arm to over the top of the radiator of the engine. This not only helps the lifting and parting of fallen cane but allows the front arm to be raised by the driver from his seat when turning on headlands, etc.

For the two side pushing bars, a 10 ft. length of 4 inch by 2 inch wood is bolted across the shield or cover of the hoe at the rear. Two lengths of one inch galvanised piping then extend from in front of the radiator to the ends of this wooden bar. These "wings," in a "V" shape, push the break.

The fitting of the front arm to the steering is of particular interest. With the burrowing action of the machine, the driver, even in average crops of well "covered in" cane, is faced with a wall of leaf and stalk and cannot see beyond the front of the engine. He has no possibility whatsoever of viewing his front roller arm and of determining where he and his machine are heading. However, the stools and pressure of cane and trash from both sides, force the arm, and in turn the machine, to follow the centre of the interspace with extreme accuracy. It has followed curved drills without error. Thus the machine calls for little attention from the driver. However a close watch is kept on the hot exhaust pipe to guard against the lodgement of dead cane leaves and the possibility of fire.

Mr. Elston has used the machine for several seasons with outstanding success. While he fully appreciates that pushing breaks is the responsibility of the cane gang, he nevertheless states that:—

(a) His method is fast and entails little inconvenience. He usually pushes the required number of breaks for a week during the one operation.

(b) The trend today is for gangs to avoid pushing breaks and to burn the maximum amount of cane possible, which may be up to a week's supply, with the one firing. By his quick and simple method the amount burnt on

each occasion can be kept to the minimum.

(c) By having several breaks pushed in advance of each burning, he secures maximum protection against "get-a-way" fires.

To any grower possessing a suitable inter-row rotary hoe, particularly to those who are responsible for their own cutting, the machine is highly recommended. Not only is the construction of the attachments simple and well within the scope of a grower's own handiwork, but the cost, especially as scrap material on the farm can be used, is practically negligible.

Fig. 77—A sample of the work done. A clean interspace is left even in recumbent crops. This break was made in a 45 t.p.a. crop of Trojan.

"The Sugar Experiment Stations Acts, 1900 to 1951"

List of Varieties of Sugar Cane Approved for Planting, 1952

Bureau of Sugar Experiment Stations, Brisbane, 1st January, 1952.

Mossman Mill Area.

Badila, Cato, Clark's Seedling, Comus, D.1135, Pindar, P.O.J.2878, Pompey, Q.44, Q.50, S.J.4, and Trojan.

Hambledon Mill Area.

Badila, Badila Seedling, Cato, Comus, Eros, Pindar, Pompey, Q.44, Q.50, and Trojan.

Mulgrave Mill Area.

North of Fig Tree Creek.

Badila, Badila Seedling, Cato, Clark's Seedling, Comus, D.1135, Eros, Pindar, P.O.J.2878, Q.44, Q.50, and Trojan.

Babinda District.

Badila, Badila Seedling, Cato, Clark's Seedling, Comus, Eros, Pindar, Q.44, Q.50, and Trojan.

Babinda Mill Area.

Badila, Badila Seedling, Cato, Clark's Seedling, Comus, Eros, Pindar, Q.44, Q.50, and Trojan.

Goondi Mill Area.

Badila, Badila Seedling, Clark's Seedling, Eros, Pindar, Pompey, Q.44, S.J.4, Trojan and Vidar.

South Johnstone Mill Area.

Badila, Badila Seedling, Clark's Seedling, Eros, Pindar, Q.44, Q.50, S.J.4, and Trojan.

Mourilyan Mill Area.

Badila, Badila Seedling, Clark's Seedling, Eros, Pindar, Q.44, Q.50, S.J.4, and Trojan.

Tully Mill Area.

Badila, Badila Seedling, Clark's Seedling, Eros, Pindar, Q.44, Q.50, and Trojan.

Victoria Mill Area.

Badila, Eros, Orion, Pindar, P.O.J. 2878, Ragnar and Trojan.

Macknade Mill Area.

Badila, Eros, Orion, Pindar, P.O.J. 2878, Ragnar and Trojan.

Invicta Mill Area.

North of Townsville.

Badila, Comus, Eros, Pindar, P.O.J. 2725, Q.50, and Trojan. The variety Clark's Seedling may be planted only in the section south of Cattle Creek.

South of Townsville.

Badila, B.208, Clark's Seedling, Comus, E.K.28, Pindar, P.O.J.2714, S.J.2, S.J.4, S.J.16, and Trojan.

Pioneer Mill Area.

Badila, B.208, Clark's Seedling, Comus, E.K.28, Pindar, P.O.J.2878, S.J.2, S.J.16, and Trojan.

Kalamia Mill Area.

Badila, B.208, Clark's Seedling, Comus, E.K.28, Pindar, P.O.J.2878, S.J.2, S.J.16, and Trojan.

Inkerman Mill Area.

Badila, B.208, Clark's Seedling, Comus, E.K.28, Pindar, P.O.J.2878, S.J.2, S.J.16, and Trojan.

Proserpine Mill Area.

Badila, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2878, Q.28, Q.45, Q.50, and Trojan.

Cattle Creek Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J.2878, Q.28, Q.45, Q.50, and Trojan.

Racecourse Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J.2878, Q.28, Q.45, Q.50, and Trojan.

Farleigh Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J. 2878, Q.28, Q.45, Q.50, S.J.2, and Trojan.

North Eton Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J.2878, Q.28, Q.45, Q.50, S.J.2, and Trojan.

Marian Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J.2878, Q.28, Q.45, Q.50, and Trojan.

Pleystowe Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J. 2878, Q.28, Q.45, Q.50, S.J.2, and Trojan.

Plane Creek Mill Area.

Badila, Badila Seedling, Clark's Seedling, Co.290, Comus, E.K.28, M.1900 Seedling, Pindar, P.O.J.2725, P.O.J.2878, Q.28, Q.45, Q.50, and Trojan.

Qunaba Mill Area.

C.P.29/116, Co.290, Pindar, P.O.J. 213, P.O.J.2878, Q.25, Q.42, Q.47, Q48, Q.49, Q.50, and Q.55.

Millaquin Mill Area.

C.P.29/116, Co.290, Pindar, P.O.J. 213, P.O.J.2878, Q.25, Q.42, Q.47, Q.48, Q49, Q.50, and Q.55.

Bingera Mill Area.

Atlas, C.P.29/116, Co.290, Pindar, P.O.J.2725, P.O.J.2878, Q.25, Q.42, Q.47, Q.48, Q.49, Q.50, Q.55 and Vesta.

Fairymead Mill Area.

C.P.29/116, Co.290, Pindar, P.O.J. 2878, Q.25, Q.42, Q.47, Q.48, Q.49, Q.50, and Q55.

Gin Gin Mill Area.

C.P.29/116, Co.290, Co.301, Mahona, M.1900 Seedling, Pindar, P.O.J. 2878, Q.25, Q.42, Q.47, Q.48, Q.49, Q.50, Q.55, and Vesta.

Isis Mill Area.

C.P.29/116, Co.290, Co.301, Pindar, P.O.J.2878, Q.42, Q.47, Q.48, Q.49, Q.50, Q.51, and Q.55.

Maryborough Mill Area.

Pialba District.

C.P.29/116, Co.290, Co.301, P.O.J. 213, P.O.J.2878, Q.42, Q.47, Q.49, Q.50 and Q.51.

Maryborough District.

C.P.29/116, Co.290, Co.301, M.1900 Seedling, P.O.J.213, P.O.J.2878, Q.42, Q.47, Q.49, Q.50, and Q.51.

Mount Bauple Mill Area.

C.P.29/116, Co.290, M.1900 Seedling, P.O.J.213, P.O.J.2878, Q.42, Q.47, Q.49, Q.50 and Q.51.

Moreton Mill Area

C.P.29/116, Pindar, Q.28, Q.42, Q.47, Q.50, Trojan, and Vesta.

Rocky Point Mill Area.

C.P.29/116, Co.290, N.Co.310, P.O.J.2878, Q.28, Q.42, Q.47, Q.49, Q.50, Q.813, Trojan and Vesta.

NORMAN J. KING,
Director of Sugar Experiment Stations.

Approved Fodder Canes

Bureau of Sugar Experiment Stations, Brisbane, 1st January, 1952.

All farmers are advised that the following are the varieties of cane which may be grown for fodder purposes in the sugar mill areas as set out below:—

Hambledon and Mulgrave Mill Areas.

China, Uba, Co.290, and "Improved Fodder Cane."

Mossman, Babinda, Goondi, South Johnstone, Mourilyan, Tully, Victoria, Macknade, Invicta, Pioneer, Kalamia, and Inkerman Mill Areas.

Uba, Co.290, and "Improved Fodder Cane."

Proserpine, Cattle Creek, Racecourse, Farleigh, North Eton, Marian, Pleystowe, and Plane Creek Mill Areas.

China, Uba, and "Improved Fodder Cane."

Qunaba, Millaquin, Bingera, Fairymead, Gin Gin, Isis, Maryborough, Mount Bauple, Moreton, and Rocky Point Mill Areas.

90 Stalk, "Improved Fodder Cane," C.S.R.1 (also known as E.G.) and Co.301.

NORMAN J. KING,
Director of Sugar Experiment Stations.

Q.50 in North Queensland

By E. A. PEMBROKE

During the 1938 crossing season at the Northern Sugar Experiment Station, Meringa, the variety P.O.J.2725 was crossed with Co.290 and the resulting fuzz from the cross after ripening, drying and packing was forwarded to the Sugar Experiment Station at Mackay. There the fuzz was germinated and after growing in flats for approximately 6-8 weeks was potted and subsequently planted out in a block with other original seedlings. In 1939 selections were made from these seedlings and one particular seedling appeared to be outstanding. Further trials proved this to be so and the seedling was given an exhaustive series of tests on all soil types on farms in that area. At the same time it was propagated extensively, eventually becoming known as Q.50, and was approved for planting in all mill areas in the Mackay district. Its effect on production in the Mackay-Proserpine areas is well known and based on its performance in these districts it was thought that the cane may have some considerable value as a purpose cane in North Queensland. Consequently Q.50 was introduced to the Meringa Experiment Station in 1945 and closely observed for two years. In 1947 it was first propagated on farms of different soil types.

These tentative investigations proved Q.50 to be a reasonably fast germinator, quick grower and good stooler, though under the wet conditions experienced in the north it lodged readily. Being an early to mid-season cane in Mackay close watch was kept on early sugar which, though not exceptionally high, was good. Excellent ratooning potentialities were evident and in both plant and ratoon canes vigour was equal to if not better than that of the standard canes.

Fig. 78—Young first ratoon Q.50, age three months on Meringa red schist soil.

Fig. 79—Showing a 35 ton crop of first ratoon Q.5 on Meringa red schist soil.

DETAILS OF TRIAL HARVEST RESULTS

G. T. Pringle, Whyanbeel, Mossman.

Harvested: 20/10/'49, 17/8/'50

CLAY SOIL TYPE

Plant	Tons per Acre.	C.C.S.
Q.50	17.38	19.01
Comus	14.86	18.98
1st Rtn.	Tons per Acre.	C.C.S.
Q.50	23.40	17.62
Comus	16.51	17.41

Leonardi & Di Palma, Whyanbeel, Mossman.

Harvested 10/9/'51.

LOW - LYING, WATERLOGGED SOIL TYPE

Plant	Tons per Acre.	C.C.S.
Q.50	31.17	18.50
Pindar	27.49	18.61
Comus	28.69	16.98
Trojan	18.90	18.39

J. Hardie, White Rock, Hambledon.

Harvested 7/7/'49.

RED SCHIST SOIL

Plant	Tons per Acre.	C.C.S.
Q.50	42.25	13.84
Q.44	30.40	13.15
Q.49	31.60	13.72
Q.47	28.50	14.01

Fox & Co., Highleigh, Mulgrave

Harvested 18/7/'49, 3/8/'50

RED BROWN SCHIST SOIL

Plant	Tons per Acre.	C.C.S.
*Q.50	33.30	12.89
Cato	27.40	16.03
1st Rtn.	Tons per Acre.	C.C.S.
*Q.50	38.30	15.29
Cato	29.25	16.79

*Q.50 lodged.

By 1948, Q.50 was appearing in varietal trials in the Mulgrave area, and in Mossman and Hambledon in the following year. Propagation plots in all mill areas were extended in conjunction with these trials and the same general picture of good average strikes, good growth and stooling presented itself, and tonnages produced were consistently higher than standard canes. Ratooning after harvest was excellent. However, on anything but the poorer lands lodging was much in evidence except in the drier years, and c.c.s. figures suffered accordingly. In 1949, Q.50 performed very well on the red schist soils where heavy crops were produced and the cane remained standing. The ratoons from those plantings lodged in 1950 although rainfall in March-April was almost identical with that of the previous year. April, 1950, however, produced heavy squally winds and this was one of the chief factors in the lodging of Q.50. In all fairness to Q.50, it is pointed out that many other canes lodged under the same conditions.

Fig. 80—A large crop of Q.50 at Wright's Creek, partly lodged.

Fig. 81.—A close up of a 35 t.p.a. crop at Meringa

By 1949, Q.50 was generally distributed and approved for planting in the Mulgrave area and followed by approval for planting in Hambledon in 1950 and in Mossman, Babinda, South Johnstone, Mourilyan and Tully in 1951.

During its five years of trial on all soil types in the four mill areas of the Cairns district it has been realised that Q.50 would not be the general purpose cane it has become in the Mackay-Proserpine area. Its vigorous habit of growth with attendant lodging makes it inadvisable to grow this cane on the better class of land. The red schist soils of the Mulgrave and Hambledon areas present somewhat of a problem. Q.50 will withstand dry conditions very well and performs excellently on this drying soil type in years of below average rainfall, particularly when a dry winter and spring are encountered. This set of conditions prevailed in 1949 and again in 1951 and at the moment Q.50 is yielding high sugar content in the Mulgrave area and has remained standing. In a wet year, however, Q.50 grows profusely on this soil type and should a windy April be experienced lodging may follow. It, therefore, remains for the grower to decide when contemplating growing Q.50 on the better soil types, whether or not in the event of wet years he is willing to risk this lodging habit together with resulting increased harvesting difficulties and a possible reduction in c.c.s. content.

On the poorer soil types of Whyanbeel and Bamboo Creek areas in Mossman and in isolated sandy or gravelly blocks in the other mill areas Q.50 is being utilised very satisfactorily and excellent crops are being produced on land which gave very disappointing returns when planted to other varieties. Scope may also be found for the use of Q.50 on the poor quality, lowlying lands such as the country at the back of Wright's Creek in the Hambledon-Mulgrave areas and in blocks of similar type to be found in all mill areas.

Q.50 in company with Pindar in particular and to a lesser extent Trojan has suffered from pineapple disease during the last two plantings, and strikes have been somewhat disappointing. Practically all other canes have suffered in varying degrees particularly during the recent dry spell. However, Q.50 and Pindar appear to have suffered most from the sett-attacking fungus and the susceptibility may have an adverse effect on their popularity. With the increased interest in mercurial dipping of cane setts, however, the disease may become of minor importance in relation to these varieties since, no doubt, future developments in dipping technique will tend to make the practice universal.

The Value of Sawdust as a Soil Mulch

Occasional enquiries are received from canegrowers regarding the value of sawdust as a soil amendment. Such queries usually spring from the fact that a grower has available to him a supply of sawdust material and is desirous of using it on his land if he can be assured that no damage to his soil or crop will result.

Sawdust has been used as a surface mulch on various small crops in different parts of the world with a view to (a) conserving soil moisture, (b) reducing weed growth or (c) keeping the surface soil cool. In the ginger industry in South Queensland, for example, a heavy sawdust mulch was employed for the last-mentioned reason. In the same way straw, animal manure and cane trash have been used as surface mulches.

There is little essential difference between sawdust and cane trash in chemical composition. Both materials have about the same content of lignin, but sawdust is higher in cellulose while trash contains more plant food substances.

Little investigational work on the beneficial or harmful effects of sawdust on the soil has been carried out in this country but there are several references to overseas work on the subject. The addition to the soil of any material rich in carbohydrates, whether it be water soluble like sugar or insoluble like trash or sawdust, results in a similar biological reaction; soil conditions are actually improved for the development of micro-organisms by reason of the additional food supply. But the limiting factor in such decomposition is a supply of nitrogen for the micro-organisms and as soon as the nitrogen in the trash or sawdust is used up, the available nitrogen in the soil is absorbed, thus bringing about temporary nitrogen starvation to any plant growing on that soil. This temporary shortage can be overcome by applying sulphate of ammonia to the soil, and as decomposition of the trash or sawdust becomes complete, the nitrogen previously used by the bacteria and fungi is made slowly available as a plant food.

When woody materials are used as a surface mulch the possibilities of nitrogen starvation are less than when such material is ploughed in. On the surface, decomposition is slow and it is not in the normal root zone. However, surface working will, in the case of sawdust, cause admixture with surface soil and the danger of nitrogen deficiency would need to be guarded against.

The value of sawdust as a source of plant food is very low. A ton of this material contains, on an average, the equivalent of about 22 pounds of sulphate of ammonia, 10 pounds of superphosphate and two pounds of muriate of potash. Any value which might accrue from its use therefore must be from other causes. There is some evidence that, used in reasonable quantities, sawdust will contribute to the loosening up of tight soils and to the prevention of hard crust formation. However, there is no experience of this treatment on sugar cane soils and any grower proposing to apply sawdust should proceed cautiously.

Most of the humus in soils is derived from those parts of plants which are most resistant to decay or decomposition. Consequently such materials as sawdust which contain a relatively high percentage of lignin could theoretically give rise to appreciable quantities of humus. Under tropical conditions, however, where soil temperatures are high, the rate of decomposition of humus is such as to prevent the accumulation of this substance in the soil.

Sawdust, contrary to general opinion, will not make soils acid. The final products of decomposition are neutral or alkaline in nature and although organic acids may be formed as intermediate products they would have little or no effect on the soil reaction. —N.J.K.

Impressions of Pindar in the Bundaberg Area

By O. W. D. MYATT

Pindar was first propagated in the Bundaberg area during the Autumn of 1948 when approximately 4 tons of this variety was introduced from Ayr, North Queensland. Plant stocks were rapidly built up in all districts during 1949-1950 and a general distribution of Pindar was made in the Bundaberg-Gin Gin and Isis districts during the Spring of 1950.

Pindar was bred by the C.S.R. Company at Macknade, North Queensland in 1937 and has for its immediate parents the varieties Co.270 and P.O.J.2878.

The introduction and approval of this variety in the Bundaberg Area was centred on its reported ability to produce good early sugar under Northern conditions, and whilst this quality has been better than districts average, its yields of cane and sugar per acre have to date been disappointing when compared with district standards. The following results are listed from current varietal trials harvested after good seasonal conditions and in summarising it is seen that Pindar, although showing the higher quality, has not stood out in ultimate sugar yields.

SUGAR EXPERIMENT STATION, BUNDABERG

Soil Type: Red volcanic loam.

SUMMARY OF CROP YIELDS

Variety	Plant Crop		First Ratoon Crop		Summary	
	Cane per acre	c.c.s. in cane	Cane per acre	c.c.s. in cane	Total cane per acre	Total sugar per acre
	Tons	Per cent.	Tons	Per cent.	Tons	Tons
C.P.29/116 ..	31·70	11·2	45·72	14·52	77·42	10·19
Q.47.. ..	30·33	15·5	40·12	14·95	70·45	10·69
Q.49.. ..	25·66	14·2	37·03	14·25	62·69	8·92
Pindar ..	21·29	17·0	35·41	16·12	56·70	9·33

M. B. GOODLIFFE, North Isis

Soil Type: Red volcanic loam. Nature of Crop: Plant Cane.
Age of Crop: 14 months. Harvested: October, 1950.

SUMMARY OF CROP YIELDS

Variety	Cane per acre	c.c.s. in cane	Sugar per acre
	Tons	Per cent.	Tons
Q.51	53·01	14·85	7·87
Q.50	51·18	15·3	7·83
C.P.29/116	42·22	13·8	5·83
Pindar	39·78	17·0	6·76
Q.47	38·97	14·7	5·73

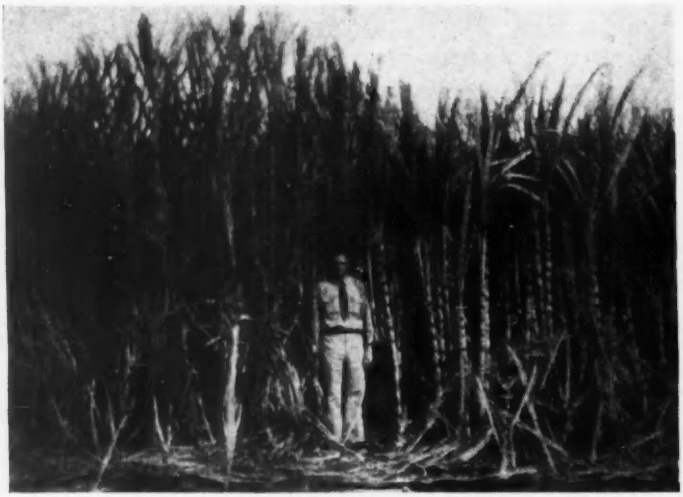

Fig. 82—The cane on the left of the photograph typifies the growth of Pindar in the Bundaberg area.

Growth impressions of the variety to date have been as follows: Germinations have been slow but reliable and under adverse seed bed conditions Pindar will maintain sett vitality for lengthy periods. Early growth is upright and characterised by an elongated primary shoot. Stalks are of medium thickness and heavy, but stooling on most soil types is weak and offers the major setback to ultimate yields under average conditions.

With good seasonal rainfall growth is rapid, but under normal district conditions (average annual rainfall 42 inches) Pindar has proved readily susceptible to dry weather spells and on the well drained major soil types leaf surfaces quickly show distress and become brown and curled. Pindar has proved a very shy arrower and gives late growth response but because of stalk deaths late in the season (December-January) it is considered that this variety is not suited as a standover type and its use in this direction is not recommended.

Sugar quality of Pindar is well above average and shows a favourable trend toward early maturity. Stalk samples tested monthly during 1949 and 1950 seasons showed a maturity peak during mid-September followed by a rapid decline in C.C.S. as the seasons progressed.

It is unfortunate that growth weaknesses have handicapped this variety for general Southern conditions but its good quality during earlier months cannot be overlooked and Pindar is well worthy of consideration in future plantings both on the alluvial flats and the better class irrigated lands.